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09/816,360	03/26/2001	Masakazu Morishita	35.C15235	7337

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EXAMINER

LEE, SHUN K

ART UNIT PAPER NUMBER

2878

DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/816,360

Applicant(s)

MORISHITA, MASAKAZU

Examiner

Shun Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 04 March 2003 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 4 March 2003 have been disapproved. The proposed drawing correction and/or the proposed substitute sheets of drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 102a, 102b, and 102c (in Fig. 14B). A proper drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While applicant may be his or her own lexicographer, a term in a claim may not be given a meaning repugnant to the usual meaning of that term. See *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947). The term "OFF voltage" (for thin film reset transistors) in independent claim 1 (and also in independent claim 9) is used by the claim to mean something other than a voltage that " ... completely turns off the transistor ... "

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because " ... the transistor 3 is held to an intermediary state between the completely ON state and the completely OFF state ... " (see lines 14-24 on pg. 21 of the specification), while the accepted meaning is a voltage such that " ... the devices are in an off condition ... " (see for example, left column on pg. 151 of the Wiley encyclopedia of Electrical and Electronics Engineering Volume 22, J. G. Webster, Editor). It is further noted that the term "OFF voltage" (for thin film read transistors) in independent claim 1 is consistent with the usual meaning of that term (see lines 18-25 on pg. 22 of the specification which state that " ... the read transistor 4 is completely turned off whereas the reset transistor 3 is not completely turned off ... "). It is suggest that "OFF voltage" (for thin film reset transistors) should probably be --intermediary state voltage--. Applicant argues that "ON voltage" and "OFF voltage" represent the two values between which the gate potential swings in the operation of the FET and is not repugnant to the usual meaning of that term. Examiner respectfully disagrees. As noted previously, the accepted meaning is a voltage such that " ... the devices are in an off condition ... ". Further, applicant does not appear to dispute that "OFF voltage" (for thin film reset transistors) is a voltage such that the device is not in an off condition. Thus the term in the claim is given a meaning repugnant to the usual meaning of that term.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5, 8-11, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (US 5,869,837) in view of Tsukamoto *et al.* (US 5,852,296) in so far as understood.

In regard to claims 1 and 9, Huang discloses (Fig. 2) an electromagnetic wave detector comprising:

- (a) conversion elements (4) for converting incident electromagnetic waves or radiations into an electric charge (column 3, lines 15-18);
- (b) storage capacitors (2) for storing (column 3, lines 15-18) the electric charge produced by the conversion elements (4);
- (c) thin film read transistors (*i.e.*, TFT readout switches 1; column 5, lines 31-35) connected respectively to the corresponding storage capacitors (2) and each having a gate to which ON and OFF voltages are applied respectively in readout and storage periods (column 3, lines 12-22); and
- (d) thin film reset transistors (*i.e.*, TFT reset switches 3) connected respectively to the corresponding storage capacitors (2) and each having a gate to which ON and OFF voltages are applied respectively in reset and storage periods (column 3, lines 40-53).

The electromagnetic wave detector of Huang lacks that the "OFF voltage" applied to the gates of the thin film reset transistors (3) being set to a value closer to the ON voltage applied to the gates of the thin film reset transistors (3) than the OFF voltage applied to the gates of the thin film read transistor (1) so that any excessive electric charge is discharged by way of the thin film reset transistors (3) in each storage period.

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Tsukamoto *et al.* teach (column 20, lines 55-67) a means to adjust a TFT gate voltage in order to sweep out the charges stored in the charge storage section when the voltage applied thereto exceeds a threshold value. Therefore it would have been obvious to one having ordinary skill in the art to adjust gate voltage of the thin film reset transistors in the electromagnetic wave detector of Huang, in order to sweep out the charges stored in the charge storage section when the voltage applied thereto exceeds a threshold value as taught by Tsukamoto *et al.*

In regard to claim 2 (which is dependent on claim 1) and claim 10 (which is dependent on claim 9), Huang also discloses (column 3, lines 15-18) that the conversion elements (4) are adapted to absorb electromagnetic waves showing an energy level higher than visible light (e.g., X-rays) and convert them into an electric charge.

In regard to claim 3 (which is dependent on claim 1) and claim 11 (which is dependent on claim 9), Huang also discloses that the thin film read transistors (1) and the thin film reset transistors (3) have a non-monocrystalline semiconductor layer (e.g., a-Si; column 5; lines 43-57) formed on an insulating substrate (glass substrate 10; Figs. 5-9).

In regard to claim 5 (which is dependent on claim 1) and claim 13 (which is dependent on claim 9), Huang also discloses (Figs. 4-9) that the conversion elements comprises a semiconductor substrate (40) having two opposite surfaces for converting electromagnetic waves into an electric charge, a common electrode (42) arranged on the one surface of the semiconductor substrate (40) and a plurality of electrodes (22)

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formed on the other surface of the semiconductor substrate (40) and separated from each other in correspondence to a plurality of two-dimensional pixels (see Fig. 4); the thin film read transistors (1) and the thin film reset transistors (3) are formed on an insulating substrate (10) such that unit cells (1, 3) each including one of the thin film read transistors (1) and one of the thin film reset transistors (3) are arranged on the insulating substrate (10) in correspondence to the pixels (see Fig. 4); and the semiconductor substrate (40) and the insulating substrate (10) form a layered structure and the plurality of electrodes (22) and the unit cells (1, 3) are electrically connected between the substrates.

In regard to claim 8 (which is dependent on claim 1) and claim 16 (which is dependent on claim 9), Huang also discloses (Fig. 3; column 5; lines 43-57) that the thin film read transistors (1) and the thin film reset transistors (3) are formed on an insulating substrate (10) provided with a driver circuit (i.e., control circuits not illustrated but described on column 4, lines 12-17) for driving the thin film read transistors (1) and the thin film reset transistors (3) and with a read circuit (14) for reading signals from the thin film read transistors (1).

6. Claims 4, 6, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (US 5,869,837) in view of Tsukamoto *et al.* (US 5,852,296) as applied to claims 1, 5, 9, and 13 above, and further in view of Jeuch *et al.* (US 5,391,881) in so far as understood.

In regard to claim 4 (which is dependent on claim 1) and claim 12 (which is dependent on claim 9), Huang also discloses (Figs. 2-9; column 5; lines 43-57) that the

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thin film read transistors (1) and the thin film reset transistors (3) are formed on an insulating substrate (10) and that the conversion elements (4) are electrically connected to the thin film read transistors (1) and the thin film reset transistors (3). The modified electromagnetic wave detector of Huang lacks that the conversion elements are formed on a substrate different from the insulating substrate. Jeuch *et al.* teach (column 2, line 14 to column 3, line 46) that conversion elements are formed on a substrate different from the insulating substrate allow the joining of a plurality of conversion element substrates and a plurality of insulating substrates so as to produce a large imaging device. Therefore it would have been obvious to one having ordinary skill in the art to provide conversion elements formed on a substrate different from the insulating substrate in the modified electromagnetic wave detector of Huang, in order to produce a large imaging device as taught by Jeuch *et al.*

In regard to claim 6 (which is dependent on claim 5) and claim 14 (which is dependent on claim 13), the modified electromagnetic wave detector of Huang lacks that the semiconductor substrate is provided in plurality as arranged two-dimensionally on the insulating substrate to form a layered structure and the common electrodes of the semiconductor substrates are mutually short-circuited. Jeuch *et al.* teach (column 2, line 14 to column 3, line 46) that conversion elements are formed on a substrate different from the insulating substrate allow the joining of a plurality of conversion element substrates and a plurality of insulating substrates so as to produce a large imaging device. Therefore it would have been obvious to one having ordinary skill in the art to join of a plurality of semiconductor substrates on an insulating substrate and

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mutually short-circuit the common electrodes of the semiconductor substrates in the modified electromagnetic wave detector of Huang, in order to produce a large imaging device as taught by Jeuch *et al.*

7. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (US 5,869,837) in view of Tsukamoto *et al.* (US 5,852,296) as applied to claims 5 and 13 above, and further in view of Jeromin *et al.* (US 6,075,248) in so far as understood.

In regard to claim 7 (which is dependent on claim 5) and claim 15 (which is dependent on claim 13), Huang also discloses (column 5, lines 25-29) that a high voltage is applied to the common electrode (42) of the conversion elements (4). The modified electromagnetic wave detector of Huang lacks that a shielding conductor is arranged near the common electrode. Jeromin *et al.* teach (Fig. 3; column 4, line 64 to column 5, line 31) that a shielding conductor (56) is arranged near the common electrode (38) in order to prevent unacceptable noise lines. Therefore it would have been obvious to one having ordinary skill in the art to provide a shielding conductor in the modified electromagnetic wave detector of Huang, in order to prevent unacceptable noise lines as taught by Jeromin *et al.*

Response to Arguments

8. Applicant's arguments filed 4 March 2003 have been fully considered but they are not persuasive.

In response to applicant's arguments (third paragraph on pg. 12 of remarks filed 4 March 2003) against the references individually, one cannot show nonobviousness by

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attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument (third and fourth paragraphs on pg. 12 of remarks filed 4 March 2003) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, individual control) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It is noted that independent claim 1 recites the limitation that the OFF voltage applied to the gates of the thin film reset transistors being set to a value closer to the ON voltage applied to the gates of the thin film reset transistors than the OFF voltage applied to the gates of the thin film read transistor. Independent claim 9 recites the limitation that any excessive electric charge is discharged by way of the thin film reset transistors in each storage period. As noted above, the term "OFF voltage" (for the thin film reset transistors) in independent claim 1 (and also in independent claim 9) is used by the claim to mean something other than a voltage that "... completely turns off the transistor ..." because "... the transistor 3 is held to an intermediary state between the completely ON state and the completely OFF state ..." (see lines 14-24 on pg. 21 of the specification). Moreover, Tsukamoto *et al.* teach (column 20, lines 55-67) a means to adjust a TFT gate voltage in order to sweep out the charges stored in the charge storage section when the voltage applied thereto exceeds a threshold value. Therefore it would have been obvious to

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one having ordinary skill in the art to adjust gate voltage of the thin film reset transistors in the electromagnetic wave detector of Huang, in order to sweep out the charges stored in the charge storage section when the voltage applied thereto exceeds a threshold value as taught by Tsukamoto *et al.*

Applicant argues (first paragraph on pg. 13 of remarks filed 4 March 2003) that Jeromin *et al.* add nothing to the teachings of Huang that remedy the aforementioned deficiency. Examiner respectfully disagrees for the reasons discussed above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Tuesday-Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SL
May 22, 2003



DAVID PORTA
SUPERVISORY PATENT EXAMINER
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